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(54) **Water runoff deflector for a vehicle at a loading dock**

Oberflächenwasserableiter für ein Fahrzeug bei einer Laderampe

Défecteur d'eau en surface pour un véhicule dans une rampe de chargement

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(56) References cited:
**EP-A- 0 493 713 DE-A1- 2 239 483
DE-A1- 4 317 054 US-A- 4 062 157
US-A- 5 553 424 US-A1- 2001 018 813
US-A1- 2003 140 579 US-B1- 6 374 554**

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Description

Background of the Invention

Field of the Invention

[0001] The present invention relates generally to loading docks and, more particularly, to a sealing apparatus for deflecting runoff along an upper surface of a vehicle at the dock.

Description of Related Art

[0002] Trucks having open rear cargo bays are typically backed into alignment with a loading dock or other doorway of a building to facilitate loading or unloading of the truck's cargo. To protect the interiors of the building and the truck from the outside weather during loading and unloading, the space between the rear of the truck and the face of the building can be at least partially sealed off by installing either a loading dock shelter or a loading dock seal around the perimeter of the doorway

[0003] Conventional loading dock seals comprise resilient, compressible pads that are attached to the building along the top and lateral edges of the doorway. The pad compliantly conforms to the rear contour of the truck as the truck presses up against the pad, thereby sealing the gap between the face of the building and the rear of the truck.

[0004] Dock shelters typically have rigid frame members, rather than compressible pads, installed along the top and lateral edges of the doorway. The frame members usually protrude one to three feet from the outside face of the building. To avoid being struck and damaged by a truck backing into the dock, the frame members are spaced farther away from the doorway than are the compressible pads of dock seals. Flexible side curtains attached to distal edges of the frame members lie generally parallel to the face of the building and extend into the anticipated path of the truck. As a truck backs into the dock, the side and head curtains sweep across the sides and top, back corner of the truck to provide sealing between the building and the rear of the truck.

[0005] Under most conditions, dock seals and dock shelters effectively seal out weather, but in certain situations additional protection is needed. If snow, for instance, accumulates on the top of the truck while the truck is parked at the dock, warm air from inside the building may warm the truck's cargo bay. This can begin melting the snow atop the truck, which can turn the snow to slush. The liquid nature of the slush can allow it to flow back toward the loading dock. Absent an effective top seal, slush or other liquid has the potential of spilling off the trailer and into the loading dock area. The problem is worse when a sloped driveway leans the truck toward the dock. A similar runoff problem may occur with heavy rain.

[0006] To address the runoff problem, U. S. Patents

6,233,885 and 6,550,191 disclose a roller sealing apparatus that provides a flow deflector along the roof of the truck. The apparatus includes a cylindrical roller that rides up and over the top of the truck as the truck backs into the dock. To help protect the roller from the truck's impact, the rear edge of the truck lifts the roller into position by pushing against a stiffener, which in turn pushes against a ramp. The ramp forces the roller's support to move the roller up and over the truck. When resting atop the truck's roof, the roller blocks any water flowing toward the back of the truck and redirects it to drain off to either side of the truck.

[0007] US 2003/0140579 A1 discloses a runoff deflector according to the preamble of claim 1. More specifically, a sealing apparatus for forming a weather seal between a vehicle and a loading dock is provided. The apparatus includes a roller seal rotatably mounted to a support for rotation about an axis. The roller seal is movable in at least a vertical direction from a first position in the path of a vehicle entering the parking area, to a second position wherein the roller seal is disposed adjacent the top of the vehicle. A curtain is suspended distally of the roller seal such that, when the roller seal is in the second position, the curtain forms a first seal with the top of the vehicle and the roller seal forms a second seal with the top of the vehicle. The curtain is semi-rigid and, in some instances, defines a ramping surface to facilitate movement of the roller seal over the leading edge of a vehicle approaching the loading dock.

[0008] Unfortunately, such a roller sealing apparatus tends to be expensive as it has to be built sturdy enough to withstand relatively high forces generated by a departing truck that includes an upwardly protruding lip along the upper rear edge of the truck. High forces can develop as the protruding lip of the departing truck catches on some edge or surface of the sealing apparatus, such as the lower edge of the ramp. Other high forces can be caused by an exceptionally tall truck backing into the dock such that the truck's upper rear edge strikes the roller sealing apparatus near the pivot point of the roller's support. In some cases, the forces may tend to lift the sealing apparatus' entire supporting framework.

[0009] Thus, there is a need for an alternative design of a deflector for deflecting runoff on an upper surface of a vehicle parked at a loading dock.

SUMMARY OF THE INVENTION

[0010] According to an aspect of the invention, a runoff deflector according to the subject-matter of independent claim 1 is provided. Further aspects and embodiments are set forth in the dependent claims, the following description and the drawings.

[0011] In some embodiments, a runoff deflector includes a frame mountable to a building wall, a seal adapted to redirect water flowing across the top of a truck, a pliable curtain that suspends the seal from the frame, and a front bumper that helps protect the seal from ve-

hicular impact and acts as a lever or lift to raise the seal on top of the truck.

[0012] In some embodiments, a front bumper that helps protect and lift the seal comprises two panels that are movable relative to each other.

[0013] In some embodiments, a front bumper that helps protect and lift the seal comprises two panels, wherein one panel is more flexible than the other.

[0014] In some embodiments, a front bumper that helps protect and lift the seal comprises at least three panels that are each movable relative to the others.

[0015] In some embodiments, a front bumper that helps protect and lift the seal is stiffer in one direction more than another.

[0016] In some embodiments, a front bumper includes a curved distal edge that helps protect the deflector from being damaged by a departing vehicle.

[0017] In some embodiments, a runoff deflector includes a pivotal frame covered by a pliable sheet that supports the frame.

[0018] In some embodiments, a runoff deflector includes a back bumper that does not protrude any farther forward than the deflector's seal.

[0019] In some embodiments, a runoff deflector includes a front bumper and a back bumper, wherein the front bumper is more flexible than the back bumper.

Brief Description of the Drawings

[0020]

Figure 1 is a perspective view of a water runoff deflector in a pendant position, wherein part of the deflector's frame covering is cutaway to show the frame.

Figure 2 is a perspective view of the runoff deflector of Figure 1 but shown in an operative position.

Figure 3 is a side view of the deflector of Figure 1.

Figure 4 is a side view of the deflector of Figure 2.

Figure 5 is a side view of the deflector of Figure 1 but showing how the deflector responds to a truck's departure.

Figure 6 is a side view of the deflector of Figure 5 but showing how the frame can yield to an exceptionally tall truck.

Figure 7 is a side view similar to Figure 3 but showing a different deflector.

Figure 8 is a side view showing a truck pushing the deflector of Figure 7 from its pendant position toward its operative position.

Figure 9 is a side view similar to Figure 4 but showing the deflector of Figure 7.

Figure 10 is a side view similar to Figure 5 but showing the deflector of Figure 7.

Figure 11 is a side view similar to Figure 3 but showing a different deflector.

Figure 12 is a side view similar to Figure 4 but showing the deflector of Figure 11.

Figure 13 is a side view similar to Figure 5 but showing the deflector of Figure 11.

Figure 14 is a side view similar to Figure 3 but showing a different deflector.

Figure 15 is a side view similar to Figure 4 but showing the deflector of Figure 14.

Figure 16 is a side view similar to Figure 5 but showing the deflector of Figure 14.

Figure 17 is a side view similar to Figure 3 but showing a different deflector.

Figure 18 is a side view similar to Figure 4 but showing the deflector of Figure 17.

Figure 19 is a side view similar to Figure 5 but showing the deflector of Figure 17.

Figure 20 is a side view of another deflector.

Figure 21 is a side view similar to Figure 7 but showing the deflector of Figure 20.

Figure 22 is a side view similar to Figure 8 but showing the deflector of Figure 20.

Figure 23 is a side view similar to Figure 9 but showing the deflector of Figure 20.

Figure 24 is a side view similar to Figure 10 but showing the deflector of Figure 20.

25 Description of the Preferred Embodiment

[0021] Figures 1 - 5 show a loading dock 10 that includes a water runoff deflector 12 mounted to a building wall 14 above a doorway 16. A truck 18, trailer, or other vehicle can back underneath deflector 12 so that a seal 20 of the deflector rests atop the truck's roof. Seal 20 helps prevent water 22 (snow, rain, ice, slush, etc.) on the truck's roof from flowing off the back end of the truck and spilling into the building. Seal 20 helps block any water 22 flowing along the truck's roof toward doorway 16 and redirects the flow off to either side of the truck. Although deflector 12 is shown being used with a dock seal 24, deflector 12 could instead be used with a dock shelter or could be used alone without either a dock seal or a dock shelter.

[0022] In some embodiments, deflector 12 comprises frame 26, seal 20, a hanger 28 that suspends seal 20 from frame 26, and a front bumper 30 that helps protect seal 20 from the impact of truck 18. In response to truck 18 entering or leaving dock 10, deflector 12 may move to a pendant position (Figures 1 and 3), an operative position (Figures 2 and 4), or various departing positions (Figure 5).

[0023] Before truck 18 enters dock 10, seal 20 of deflector 12 hangs in a pendant position as shown in Figures 1 and 3. In this position, seal 20 hangs directly underneath a pivotal axis 32 about which seal 20 and hanger 28 can rotate.

[0024] As truck 18 backs underneath deflector 12, an upper rear edge of truck 18 engages front bumper 30 and forces bumper 30 and seal 20 to pivot upward and toward wall 14 until seal 20 rests atop the truck's roof as shown in Figure 4. In this position, seal 20 creates a dam

or an obstruction to water 22 tending to flow back toward wall 14. Instead of flowing off the back end of truck 18, the water is now redirected to flow off to either side of truck 18.

[0025] The construction of seal 20 may vary, but in some cases, seal 20 comprises a cylindrical foam pad encased within a pliable covering. A portion of the covering may extend upward from seal 20 to axis 32, whereby hanger 28 is made of a pliable panel 34. Panel 34 and the covering around seal 20 may be any of a variety of materials including, but not limited to, HYPALON, canvas duck, rubber-impregnated fabric, and coated nylon or polyester fabric. The simplified design provides seal 20 and hanger 28 with significant flexibility, even though the construction inhibits seal 20 from continually rotating about itself.

[0026] Front bumper 30 preferably includes a lower panel 36 that is stiffer than the material of hanger 28 and the covering of seal 20 so that panel 36 can effectively lift seal 20 onto the top of truck 18. Panel 36 can be made of a variety of materials including, but not limited to, polyethylene, polypropylene, etc. When truck 18 departs, high forces between panel 36 and the rear edge of truck 18 (which forces may be increased by the presence of upwardly protruding lip 38) can be avoided by having a more flexible upper panel 40 (e.g., HYPALON, canvas duck, rubber-impregnated fabric, coated nylon or polyester fabric, etc.) suspend lower panel 36 from frame 26.

[0027] Figure 5, for instance, shows lower panel 36 being caught by lip 38 as truck 18 pulls away from the dock. The greater flexibility of upper panel 40, however, allows bumper 30 to readily yield without damage as truck 18 continues to move forward away from wall 14. After the truck leaves, deflector 12 can return to its original pendant position of Figure 1.

[0028] If an exceptionally tall truck 18' pulls out from underneath deflector 12, as shown in Figure 6, frame 26 can yield with upward pivotal motion about points 42. In this case, frame 26 preferably includes a pliable sheet 44 (e.g., HYPALON, canvas duck, rubber-impregnated fabric, coated nylon or polyester fabric, etc.) or some other flexible member (e.g., a cable, chain, strap, etc.) whose tension limits the downward pivotal movement of the frame. Thus, frame 26 can yield by pivoting upward, but the tension in sheet 44 helps prevent the frame from drooping. Indeed, sheet 44 serves in some sense as a structural member in the depicted embodiment, since the load of the frame and the suspended seal 20 and bumper 30 is borne by sheet 44. Using the tensile strength of sheet 44 in this manner yields a desirable frame design that minimizes the need for structural metal while providing enhanced functionality and aesthetics as compared to conventional designs. Moreover, sheet 44 serves the additional function of creating a canopy/awning/hood over the top seal assembly.

[0029] In some embodiments, as shown in Figures 7, 8, 9 and 10 (Figures 7, 9 and 10 correspond to Figures 3, 4 and 5 respectively), a deflector 46 includes a front

bumper 48 that comprises a plurality of interconnected panels 50, 52 and 54. Individually the panels are relatively stiff, but are pivotally interconnected so that bumper 48 yields more readily in one direction than another. This creates a bumper that acts relatively stiff as truck 18 backs into the dock (Figure 8), whereby the stiffness helps in lifting seal 20 atop of truck 18. Yet, bumper 48 is more yieldable to reduce forces between lip 38 and bumper 48 as the truck departs (Figure 10). The bumper's variation in yieldability can be achieved by having a pivotal joint 56 of adjoining panels be at an intermediate position between the upper and lower edges of a given panel.

[0030] The examples shown in Figures 11 to 16 are of illustrative nature but do not belong to the present invention in the meaning of Art. 82 EPC.

[0031] In Figures 11, 12 and 13 (which correspond to Figures 3, 4 and 5 respectively), a deflector 58 includes a rotatable seal 60 suspended from a rigid hanger 62 that can pivot about an upper axis 64. A back bumper 66, in the form of a generally rigid plate, is attached to hanger 62 to help provide front bumper 30 with some back support and to help prevent lip 38 from catching on any edges of hanger 58 as truck 18 departs. Seal 60 preferably extends in front of back bumper 66. In some cases, back bumper 66 is fully contained within a region 68 defined by two converging imaginary planes 70 and 72 that lie tangent to the peripheral surface of seal 60 and intersect axis 64. With back bumper 66 in such a receded position, the back bumper does not have to be as sturdy since front bumper 30 and seal 60 absorb much of the truck's impact.

[0032] Figures 14, 15 and 16 show a deflector 74 that is very similar to deflector 58 except a back bumper 76 replaces back bumper 66. Back bumper 76 is a curved rigid plate that includes a curved distal edge 78. The curvature of edge 78 makes it especially unlikely for lip 38 of a departing truck to adversely catch on anything of deflector 74.

[0033] Another deflector 80, shown in Figures 17, 18 and 19, includes a front bumper 82 whose structure is very similar to that of back bumper 76 of deflector 74. A seal 84 of deflector 80 includes an internal metal pipe 86 for added weight, which increases the sealing force that seal 84 applies to the roof of truck 18.

[0034] In another embodiment, as shown in Figures 20 - 24 (Figures 21, 22, 23 and 24 correspond to Figures 7, 8, 9 and 10 respectively), a deflector 90 includes a front bumper 92 that comprises a plurality of interconnected panels 94, 96 and 98. Individually the panels are relatively stiff, but are pivotally interconnected so that bumper 92 yields more readily in one direction than another. This creates a bumper that acts relatively stiff as truck 18 backs into the dock (Figure 22), whereby the stiffness helps in lifting seal 20 atop of truck 18. Yet, bumper 92 is more yieldable to reduce forces between lip 38 and bumper 92 as the truck departs (Figure 24). In this case, the bumper's variation in yieldability is achieved by hav-

ing panels 94, 96 and 98 be interconnected by a plurality of flexible panels 100, 102 and 104.

[0035] Although the invention is described with reference to presently preferred embodiments, it should be appreciated by those skilled in the art that various modifications are well within the scope of the invention. Therefore, the scope of the invention is to be determined by the claims that follow.

Claims

1. A deflector for deflecting runoff on an upper surface of a vehicle parked at a loading dock that is adjacent to a building wall, the deflector comprising:

a frame (26) attachable to the building wall,
a seal (20; 84) in front of the building wall and being vertically and horizontally movable to engage the upper surface of the vehicle, and
a front bumper (30; 48; 82; 92) in front of the seal (20; 84) to help protect the seal (20; 84) from vehicular impact and to help lift the seal (20; 84) onto the vehicle, and
a flexible hanger (28) on which the seal (20; 84) is mounted to suspend from the frame (26),

characterized in that:

the seal (20; 84) is encased within a pliable covering wherein a portion of the covering is connected to the hanger (28) to limit the seal (20; 84) from continual rotation about itself when the vehicle enters or leaves the loading dock.

2. The deflector of claim 1, wherein the front bumper (30; 48; 82; 92) comprises a first panel (40) and a second panel (36) that are pivotally interconnected so that the first panel (40) and the second panel (36) are movable relative to each other.
3. The deflector of claim 1, wherein the hanger (28) comprises a pliable panel.
4. The deflector of claim 3, wherein the pliable panel extends around the seal (20; 84).
5. The deflector of claim 2, wherein the first panel is more flexible than the second panel.
6. The deflector of claim 2, wherein the front bumper (30; 48; 82; 92) comprises a third panel that is movable relative to the first panel and the second panel.
7. The deflector of claim 1, wherein the front bumper (30; 48; 82; 92) can yield more readily in a forward direction away from the building wall than in a rearward direction toward the building wall when the de-

flector is attached to the building wall.

8. The deflector of claim 1, wherein the front bumper (30; 48; 82; 92) includes a curved distal edge that helps prevent the vehicle from damaging the deflector as the vehicle departs the loading dock.
9. The deflector of claim 1, wherein the frame (26) is attachable to the building wall such that the frame (26) can pivot relative thereto, and further comprising a flexible member engaging the frame (26) and held in tension to limit downward pivotal movement of the frame (26).
10. The deflector of claim 9, wherein the flexible member is a pliable sheet that overlays the frame (26), whereby the pliable sheet and the frame (26) provide a canopy.
11. The deflector of claim 1, further comprising a back bumper (76) in back of the front bumper (30; 48; 82; 92) to act as a load bearing surface against which the front bumper (30; 48; 82; 92) can push as the vehicle enters the loading dock, wherein the hanger (28) that suspends the seal (20; 84), the front bumper (30; 48; 82; 92), and the back bumper (76) from the frame (26) such that the seal (20; 84) extends appreciably farther forward than the back bumper (76) when the frame (26) is attached to the building wall.
12. The deflector of claim 11, wherein the back bumper (76) is more rigidly attached than is the front bumper (30; 48; 82; 92).
13. The deflector of claim 11, wherein the hanger (28) defines a pivotal axis about which the seal (20; 84) is able to rotate, and wherein two converging imaginary planes extend tangentially from the peripheral surface of the seal (20; 84) to the pivotal axis such that the peripheral surface and the two converging imaginary lines define a region in which the back bumper (76) is fully contained.

Patentansprüche

1. Abweiser zum Abweisen von Abfluss auf einer oberen Oberfläche eines Fahrzeugs, das an einer Laderampe geparkt ist, die in Nähe einer Gebäudewand ist, wobei der Abweiser umfasst:

einen Rahmen (26), der an der Gebäudewand befestigbar ist,
eine Dichtung (20; 84) vor der Gebäudewand und die vertikal und horizontal beweglich ist, um mit der oberen Oberfläche des Fahrzeugs in Eingriff zu kommen, und
einen vorderen Stoßfänger (30; 48; 82; 92) vor

der Dichtung (20; 84), um zu helfen, die Dichtung (20; 84) vor einem Fahrzeugaufprall zu schützen und um zu helfen, die Dichtung (20; 84) auf das Fahrzeug zu heben, und einen flexiblen Aufhänger (28), an dem die Dichtung (20; 84) angebracht ist, um sie von dem Rahmen (26) herabhängen zu lassen,

dadurch gekennzeichnet, dass:

- die Dichtung (20; 84) in einer biegsamen Abdeckung verkleidet ist, wobei ein Teil der Abdeckung mit dem Aufhänger (28) verbunden ist, um eine kontinuierliche Rotation der Dichtung (20; 84) um sich selbst einzuschränken, wenn das Fahrzeug in die Laderampe eintritt oder sie verlässt.
2. Abweiser nach Anspruch 1, bei welchem der vordere Stoßfänger (30; 48; 82; 92) eine erste Platte (40) und eine zweite Platte (36) umfasst, die drehbar verbunden sind, so dass die erste Platte (40) und die zweite Platte (36) zueinander beweglich sind.
 3. Abweiser nach Anspruch 1, bei welchem der Aufhänger (28) eine biegsame Platte umfasst.
 4. Abweiser nach Anspruch 3, bei welchem sich die biegsame Platte um die Dichtung (20; 84) erstreckt.
 5. Abweiser nach Anspruch 2, bei welchem die erste Platte flexibler ist als die zweite Platte.
 6. Abweiser nach Anspruch 2, bei welchem der vordere Stoßfänger (30; 48; 82; 92) eine dritte Platte umfasst, die beweglich bezüglich der ersten Platte und der zweiten Platte ist.
 7. Abweiser nach Anspruch 1, bei welchem der vordere Stoßfänger (30; 48; 82; 92) leichter in einer Richtung nach vorne weg von der Gebäudewand nachgeben kann als in einer Richtung nach hinten zu der Gebäudewand, wenn der Abweiser an der Gebäudewand befestigt ist.
 8. Abweiser nach Anspruch 1, bei welchem der vordere Stoßfänger (30; 48; 82; 92) eine gebogene distale Kante umfasst, die hilft, das Fahrzeug daran zu hindern, den Abweiser zu beschädigen, wenn das Fahrzeug die Laderampe verlässt.
 9. Abweiser nach Anspruch 1, bei welchem der Rahmen (26) an der Gebäudewand befestigbar ist, so dass der Rahmen (26) dazu schwenken kann, und des Weiteren ein flexibles Element umfassend, das mit dem Rahmen (26) in Eingriff steht und in Spannung gehalten wird, um eine nach unten gerichtete Schwenkbewegung des Rahmens (26) zu begren-

zen.

10. Abweiser nach Anspruch 9, bei welchem das flexible Element ein biegsames Blatt ist, das den Rahmen (26) überlagert, wodurch das biegsame Blatt und der Rahmen (26) ein Verdeck bereitstellen.
11. Abweiser nach Anspruch 1, des Weiteren umfassend einen hinteren Stoßfänger (76) hinter dem vorderen Stoßfänger (30; 48; 82; 92), so dass er als eine lasttragende Oberfläche wirkt, gegen die der vordere Stoßfänger (30; 48; 82; 92) drücken kann, wenn das Fahrzeug in die Laderampe eintritt, wobei der Aufhänger (28) die Dichtung (20; 84), den vorderen Stoßfänger (30; 48; 82; 92) und den hinteren Stoßfänger (76) von dem Rahmen (26) herabhängen lässt, so dass die Dichtung (20; 84) sich erkennbar weiter nach vorne erstreckt als der hintere Stoßfänger (76), wenn der Rahmen (26) an der Gebäudewand befestigt ist.
12. Abweiser nach Anspruch 11, bei welchem der hintere Stoßfänger (76) fester befestigt ist als der vordere Stoßfänger (30; 48; 82; 92).
13. Abweiser nach Anspruch 11, bei welchem der Aufhänger (28) eine Schwenkachse definiert, um die die Dichtung (20; 84) in der Lage ist, zu drehen, und wobei zwei konvergierende imaginäre Ebenen sich tangential von der äußeren Oberfläche der Dichtung (20; 84) zu der Schwenkachse erstrecken, so dass die äußere Oberfläche und die zwei konvergierenden imaginären Linien einen Bereich definieren, in dem der hintere Stoßfänger (76) vollständig enthalten ist.

Revendications

1. Déflecteur pour défléchir un écoulement sur une surface supérieure d'un véhicule en stationnement au niveau d'un quai de chargement qui est adjacent à un mur de bâtiment, le déflecteur comprenant :
 - un cadre (26) pouvant être fixé au mur de bâtiment,
 - un dispositif d'étanchéité (20 ; 84) devant le mur de bâtiment et mobile verticalement et horizontalement pour entrer en prise avec la surface supérieure du véhicule, et
 - un butoir avant (30 ; 48 ; 82 ; 92) devant le dispositif d'étanchéité (20 ; 84) pour aider à protéger le dispositif d'étanchéité (20 ; 84) d'un impact de véhicule et pour aider à lever le dispositif d'étanchéité (20 ; 84) sur le véhicule, et
 - un dispositif de suspension flexible (28) sur lequel le dispositif d'étanchéité (20 ; 84) est monté pour être suspendu à partir du cadre (26),

caractérisé en ce que :

- le dispositif d'étanchéité (20 ; 84) est entouré d'un revêtement flexible dans lequel une partie du revêtement est raccordée au dispositif de suspension (28) pour empêcher le dispositif d'étanchéité (20 ; 84) de tourner en continu sur lui-même lorsque le véhicule entre dans le quai de chargement ou le quitte.
2. Déflecteur selon la revendication 1, dans lequel le butoir avant (30 ; 48 ; 82 ; 92) comprend un premier panneau (40) et un deuxième panneau (36) qui sont raccordés l'un à l'autre de façon pivotante pour que le premier panneau (40) et le deuxième panneau (36) soient mobiles l'un par rapport à l'autre.
 3. Déflecteur selon la revendication 1, dans lequel le dispositif de suspension (28) comprend un panneau flexible.
 4. Déflecteur selon la revendication 3, dans lequel le panneau flexible s'étend autour du dispositif d'étanchéité (20 ; 84).
 5. Déflecteur selon la revendication 2, dans lequel le premier panneau est plus flexible que le deuxième panneau.
 6. Déflecteur selon la revendication 2, dans lequel le butoir avant (30 ; 48 ; 82 ; 92) comprend un troisième panneau qui est mobile par rapport au premier panneau et au deuxième panneau.
 7. Déflecteur selon la revendication 1, dans lequel le butoir avant (30 ; 48 ; 82 ; 92) peut céder plus facilement dans une direction vers l'avant pour s'éloigner du mur de bâtiment que dans une direction vers l'arrière vers le mur de bâtiment lorsque le déflecteur est fixé au mur de bâtiment.
 8. Déflecteur selon la revendication 1, dans lequel le butoir avant (30 ; 48 ; 82 ; 92) comprend un bord distal incurvé qui aide à empêcher le véhicule d'endommager le déflecteur lorsque le véhicule s'éloigne du quai de chargement.
 9. Déflecteur selon la revendication 1, dans lequel le cadre (26) peut être fixé au mur de bâtiment de sorte que le cadre (26) puisse pivoter par rapport à celui-ci, et comprenant en outre un élément flexible entrant en prise avec le cadre (26) et maintenu en tension pour limiter le mouvement de pivotement descendant du cadre (26).
 10. Déflecteur selon la revendication 9, dans lequel l'élément flexible est une feuille flexible qui recouvre le cadre (26), moyennant quoi la feuille flexible et le

cadre (26) fournissent un auvent.

11. Déflecteur selon la revendication 1, comprenant en outre un butoir arrière (76) à l'arrière du butoir avant (30 ; 48 ; 82 ; 92) pour servir de surface portante contre laquelle le butoir avant (30 ; 48 ; 82 ; 92) peut pousser lorsque le véhicule entre dans le quai de chargement, dans lequel le dispositif de suspension (28) suspend le dispositif d'étanchéité (20 ; 84), le butoir avant (30 ; 48 ; 82 ; 92), et le butoir arrière (76) à partir du cadre (26) de sorte que le dispositif d'étanchéité (20 ; 84) s'étende sensiblement plus vers l'avant que le butoir arrière (76) lorsque le cadre (26) est fixé au mur de bâtiment.
12. Déflecteur selon la revendication 11, dans lequel le butoir arrière (76) est fixé de façon plus rigide que le butoir avant (30 ; 48 ; 82 ; 92).
13. Déflecteur selon la revendication 11, dans lequel le dispositif de suspension (28) définit un axe de pivotement sur lequel le dispositif d'étanchéité (20 ; 84) est capable de tourner, et dans lequel deux plans imaginaires convergents s'étendent tangentielle-ment de la surface périphérique du dispositif d'étanchéité (20 ; 84) à l'axe de pivotement de sorte que la surface périphérique et les deux lignes imaginaires convergentes définissent une région dans laquelle le butoir arrière (76) est complètement contenu.

FIG. 1

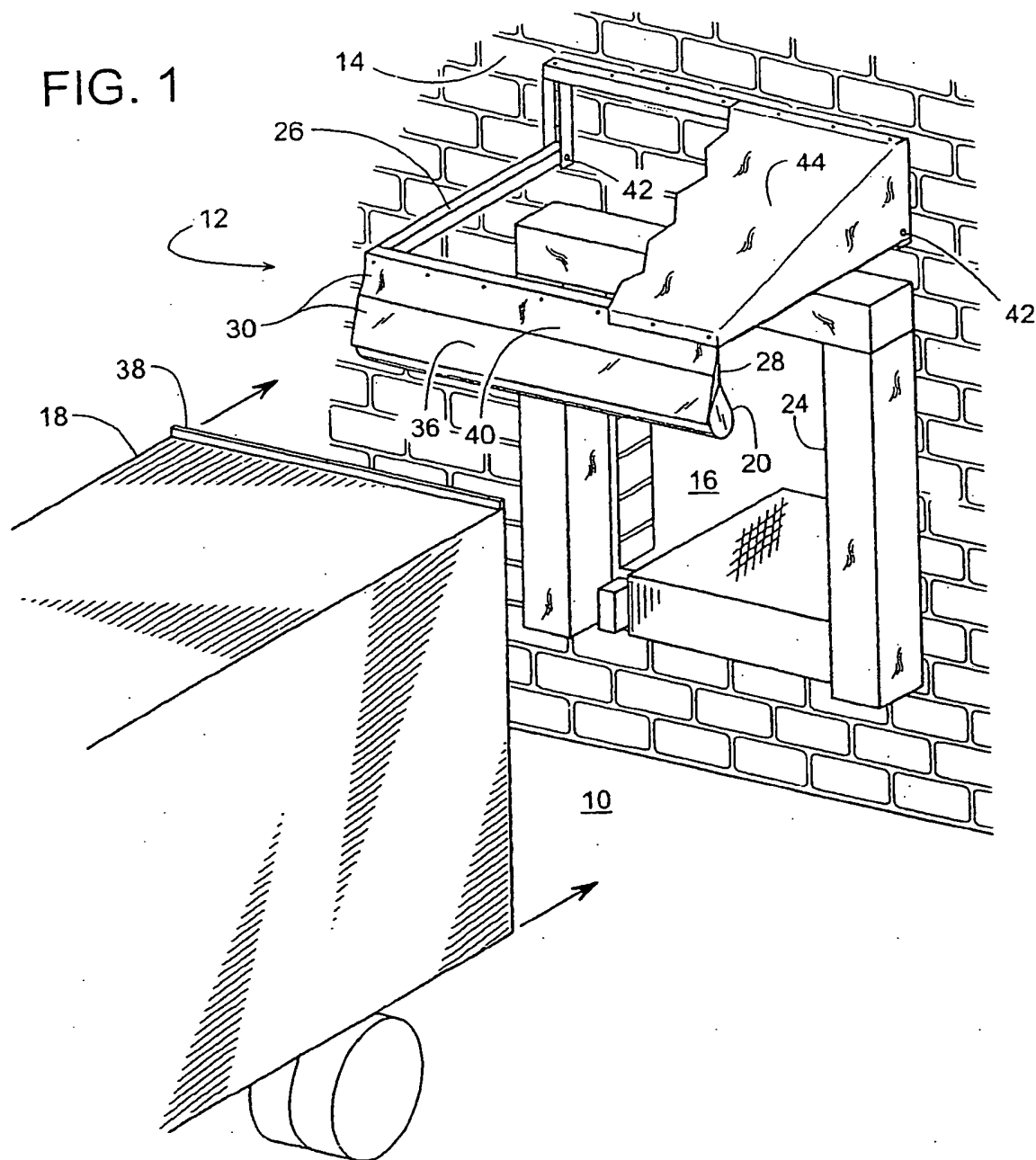


FIG. 2

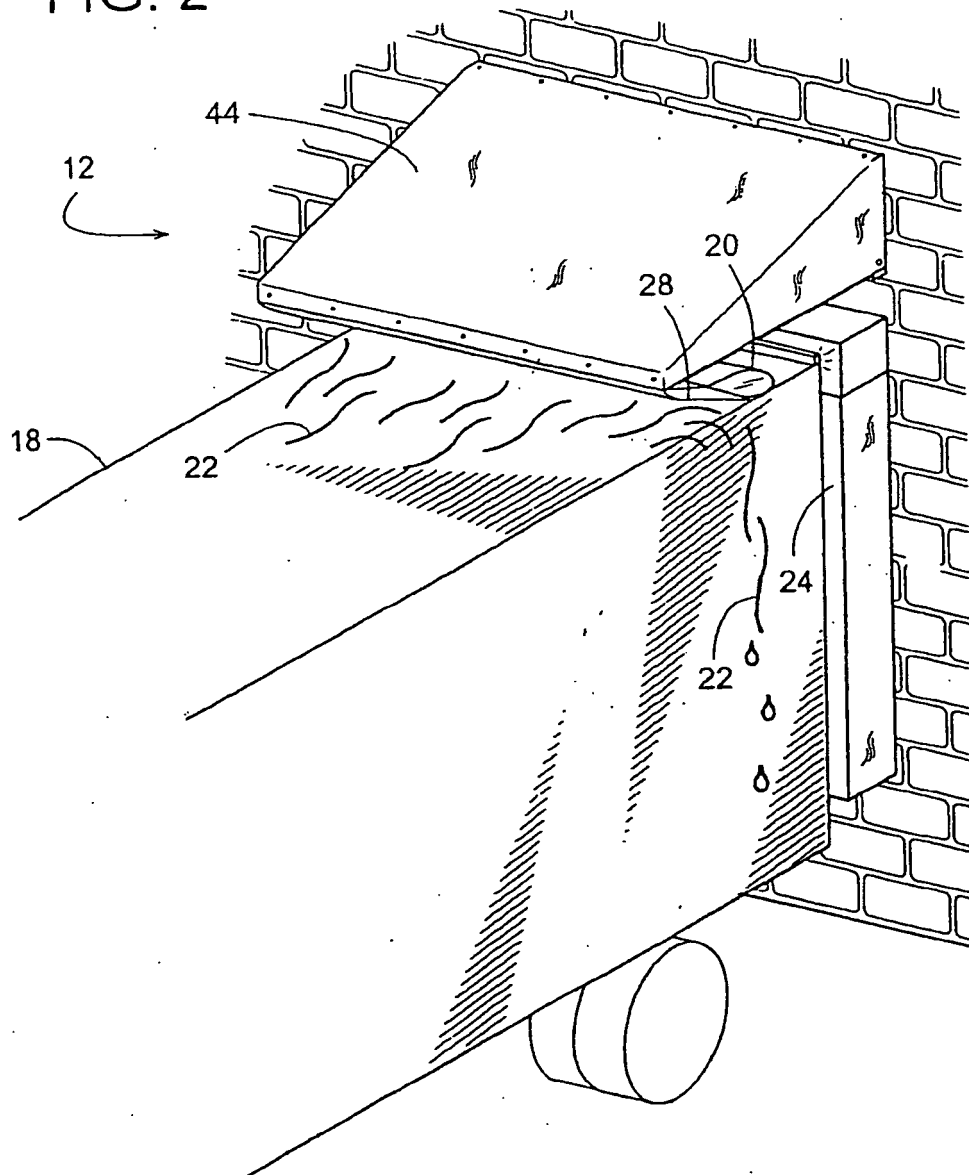


FIG. 3

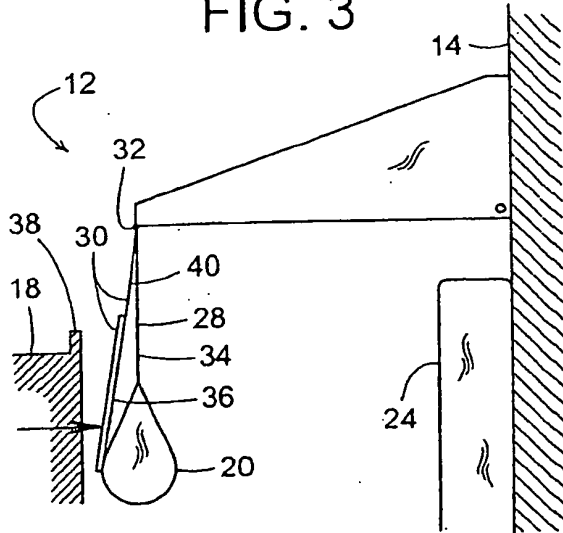


FIG. 4

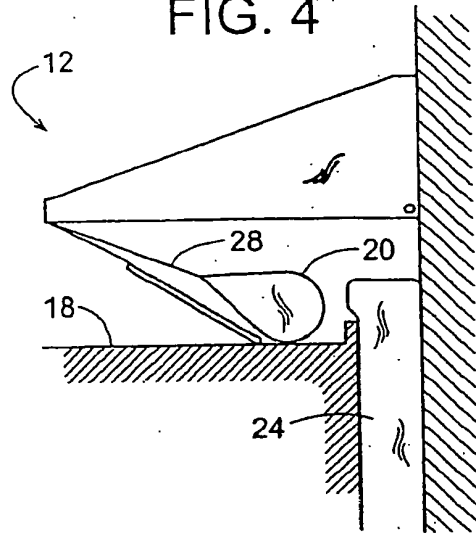


FIG. 5

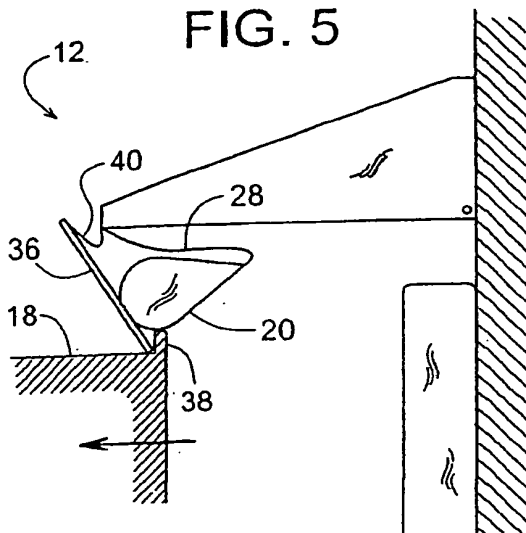
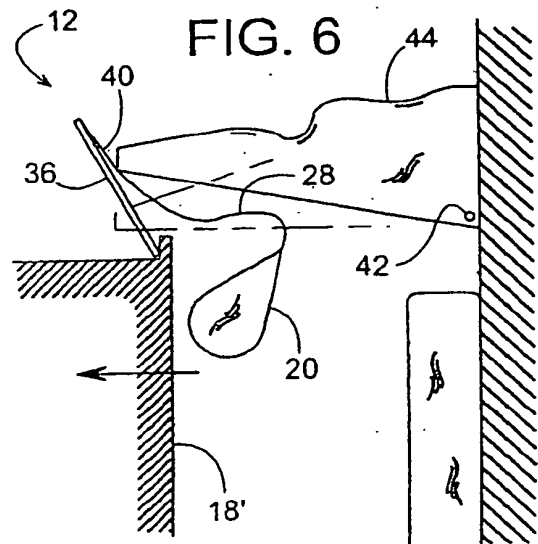


FIG. 6



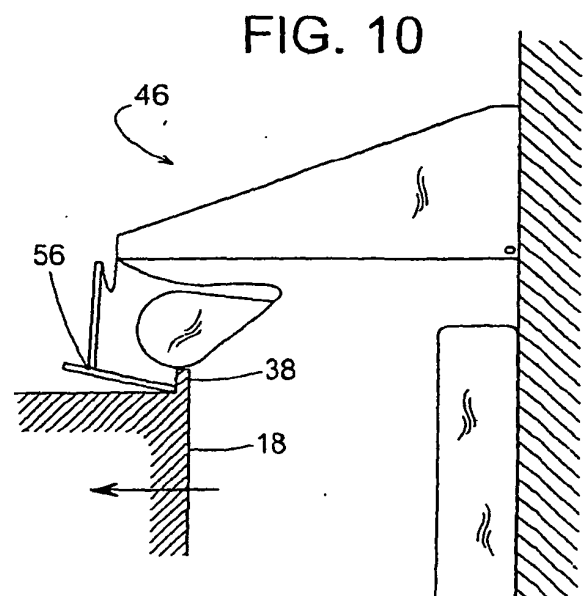
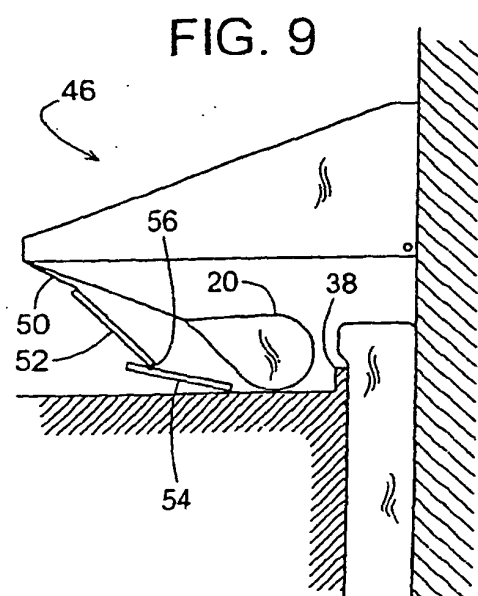
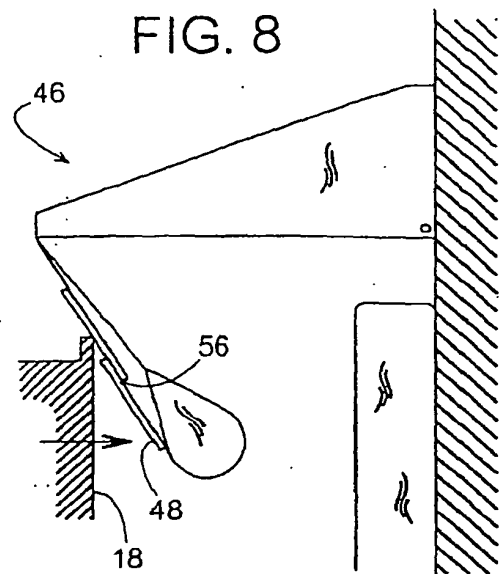
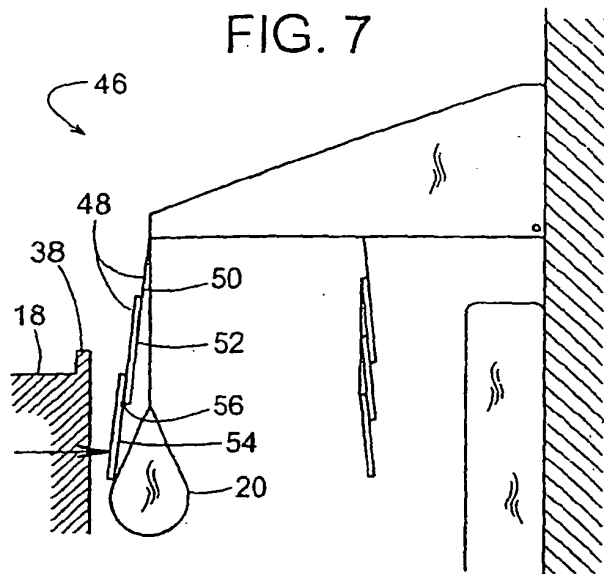


FIG. 11

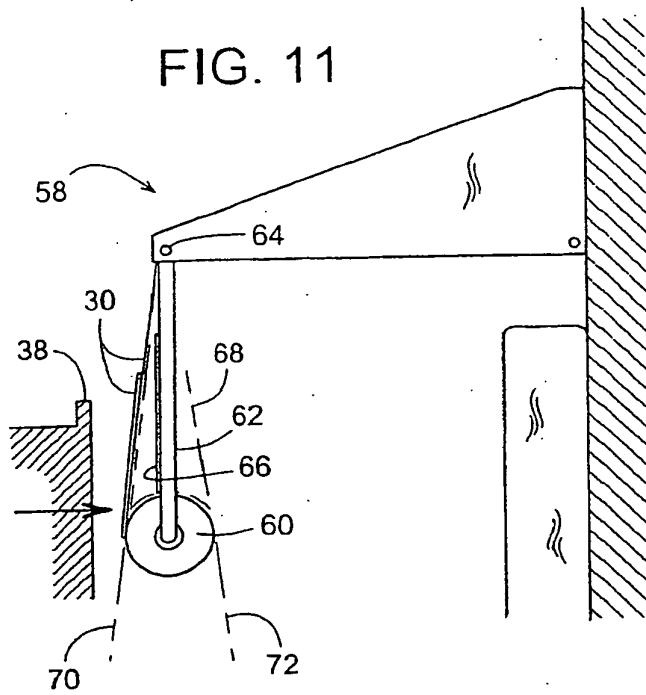


FIG. 12

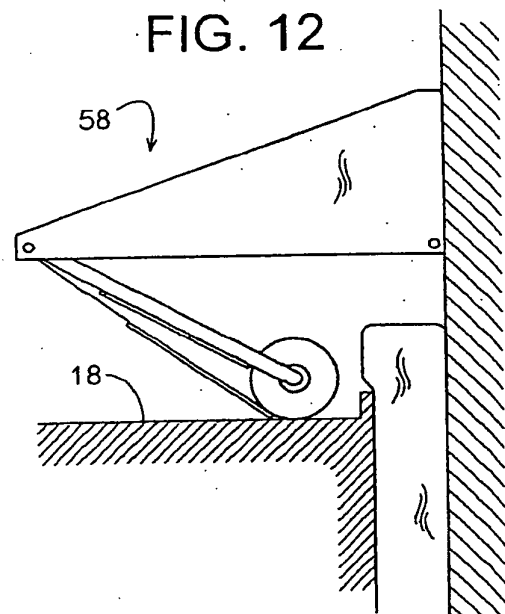


FIG. 13

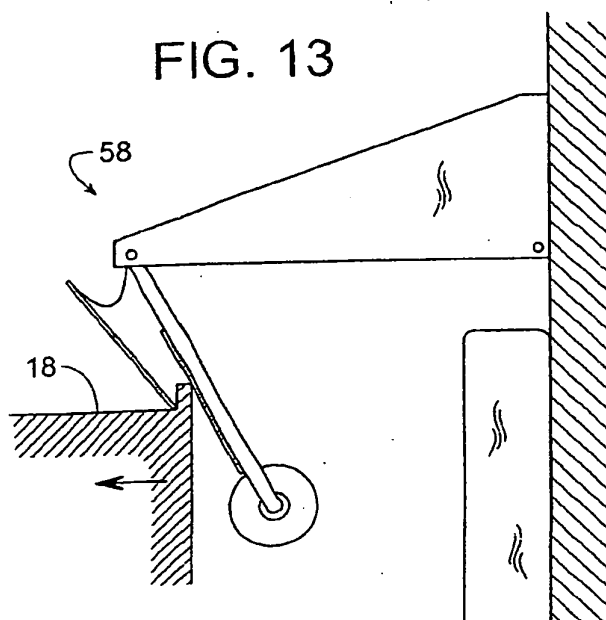


FIG. 14

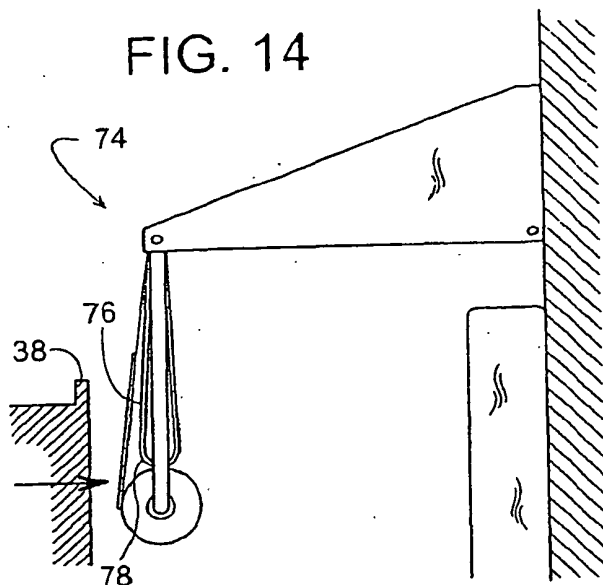


FIG. 15

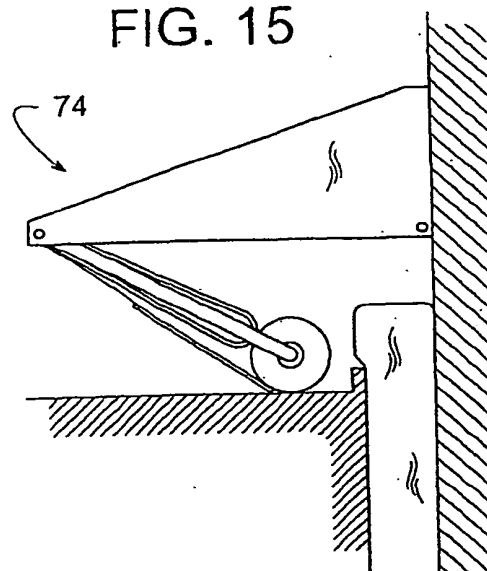


FIG. 16

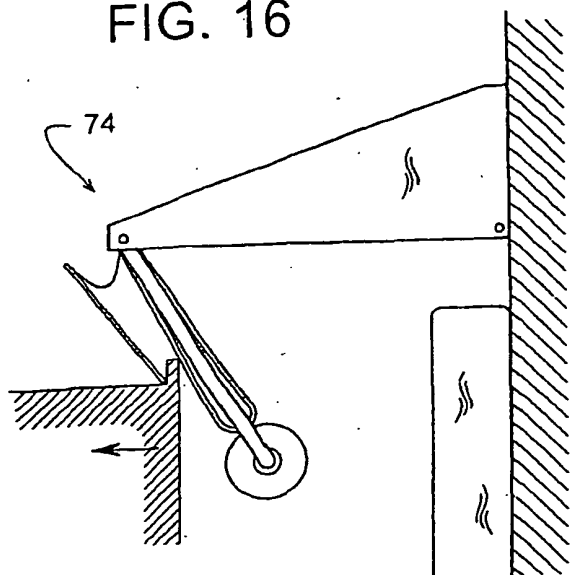


FIG. 17

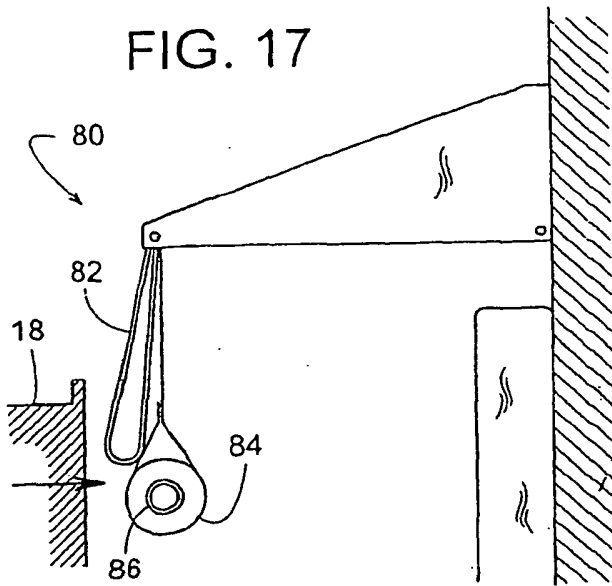


FIG. 18

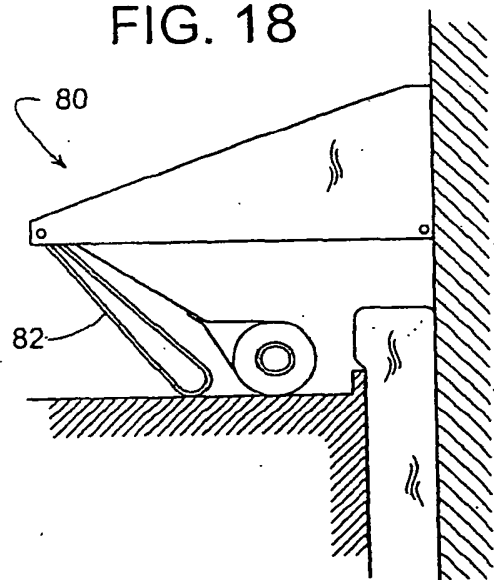


FIG. 19

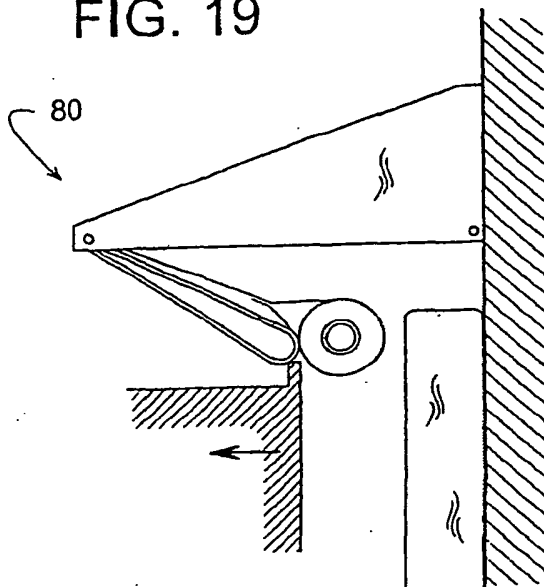
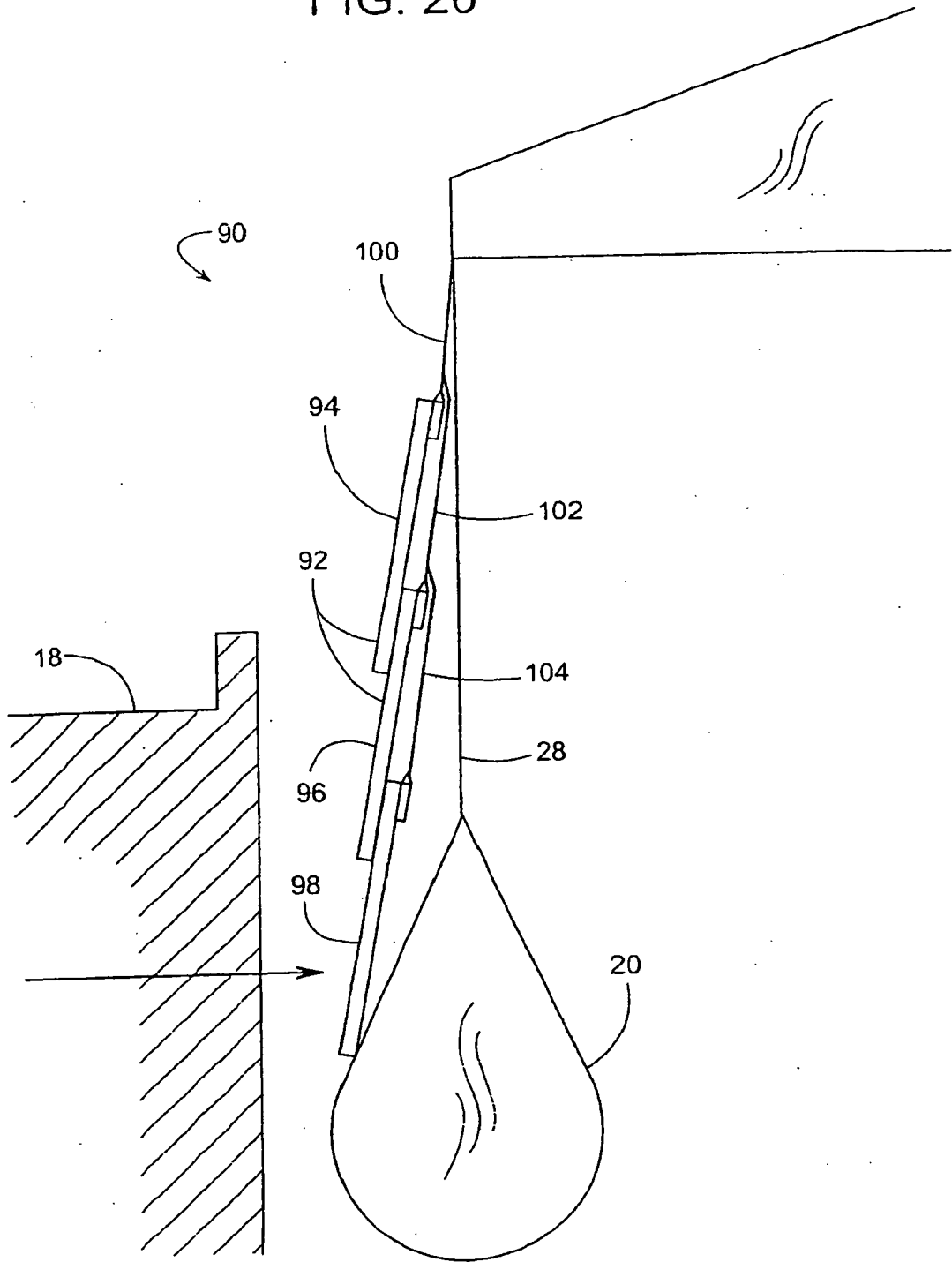
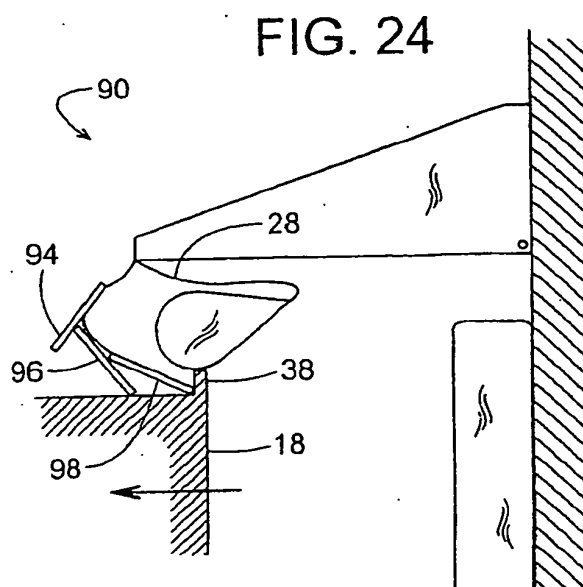
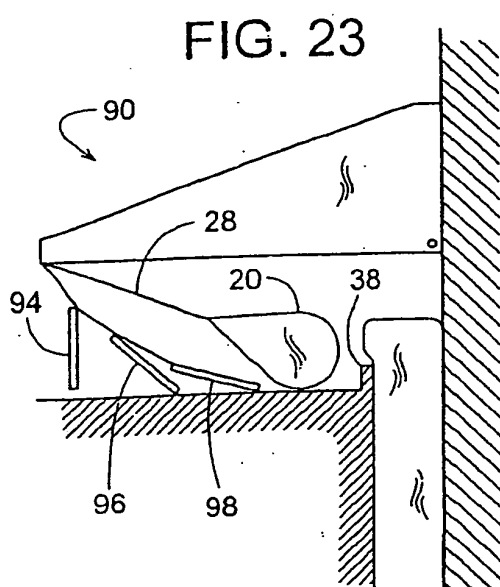
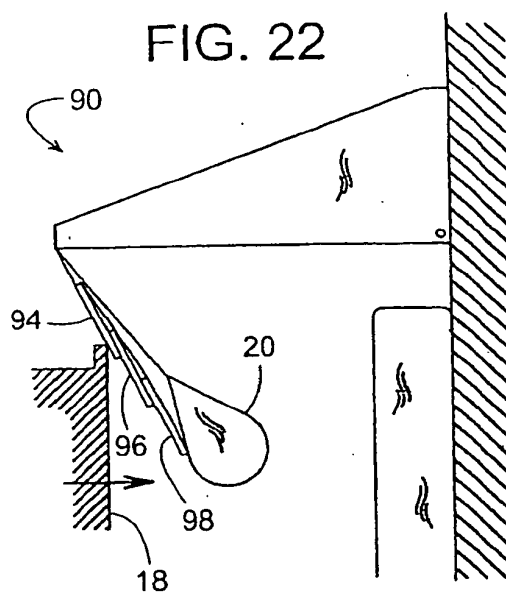
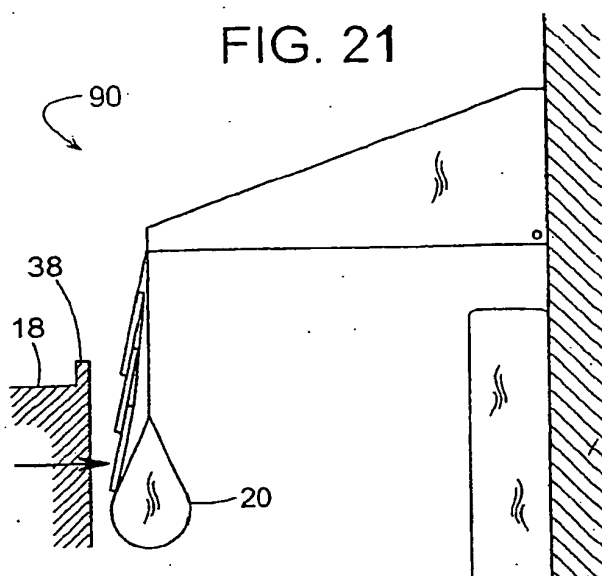


FIG. 20





REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- US 6233885 B [0006]
- US 6550191 B [0006]
- US 20030140579 A1 [0007]